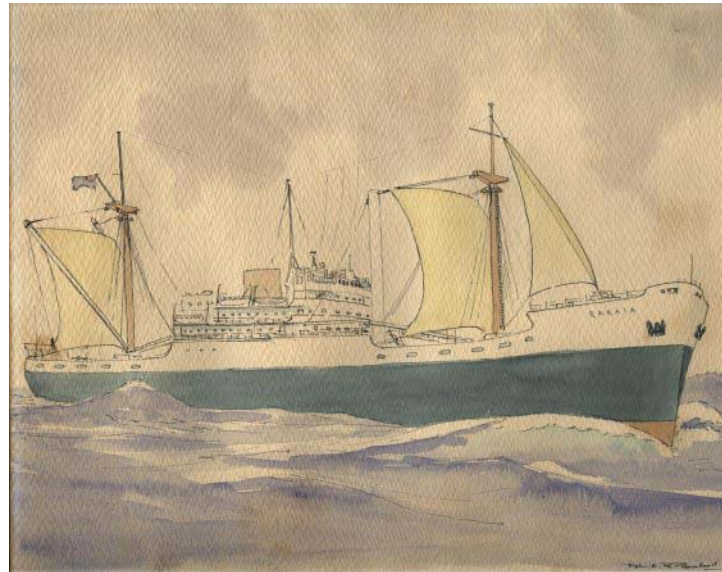


**JURY SAILS IN THE NORTH ATLANTIC
BY
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A water colour painted by one of the cadets on this voyage and presented to the author

The practical usefulness of jury sails to steady a ship's movement, during a breakdown, was recently very well demonstrated when the New Zealand Shipping Company's M.V. Rakaia (8,213 tons gross) (Captain H N Lawson RNR) sustained a major engine breakdown on the homeward run across the North Atlantic from New York for Liverpool.

Due to a piston rod becoming fractured and resultant damage to No. 8 crankcase, the 2-ton connecting rod broke loose, smashed through the crankcase door and flailed about until the engine was stopped. Fortunately, no injuries to personnel were

involved, but the vessel was brought to a standstill, some 300 miles off Halifax, and a long and complicated job of engine repairs had to be undertaken.

The weather was, at first, exceptionally fine for mid-October and good progress was made with clearing, stowing and lashing the damaged machinery, etc., and tackling the repair, but conditions deteriorated and increasingly hampered the work until, after about 36 hours, it seemed that work might have to be completely suspended, due to the vessel rolling (wind WNW force 5-6, moderate swell, ship's head SSW).

To enable the engineers' work to continue and progress, the ship's movement had to be steadied and it was decided to rig some form of jury sail with this objective.

The Jury Rig

No. 4 awning was selected as the most suitable available to make a sail, which could be hoisted at No. 1 hatch. The awning was first doubled over and backed with three gangway nets. Its stops were used to lace the sides and top together, while the bottom was stopped off at about 3-ft intervals with three to four stitches of roping twine. The sheets of the sail consisted of two light wire pennants, to which small luff tackles were attached. The forward bottom corner also had a small tackle attached, while a 3-inch rope gantline was made fast to the forward top corner and taken through various lead blocks to the windlass.

A tail block was sent aloft and made fast to the forward side of the foremast beneath the table and a gantline, made fast to the peak of the sail, was rove off through this block and taken to the inboard drum of No. 1 starboard winch (weather-side). The sail was then hoisted up the foremast until well clear of No. 1 hatch and hauled out by the windlass.

Making and rigging this contraption occupied a dozen hands for somewhat over an hour, but it was heavy and rather unwieldy and it lasted for only a few minutes before the tail block carried away. Another block and gantline were quickly fixed and the rig rehoisted. This time, it served for about one-and-a-half hours – long enough for the ship's behaviour to show signs of responding and, therefore, to justify attempts to increase the canvas. (The fo'c'sle headrail had, in the meantime, been frapped on the starboard side with strips of old tarpaulin, crosslaced overall with heaving lines.)

To form a rig in the starboard shrouds, a 24-ft. spar and old tarpaulin were used. About eight large eyelets were put into the canvas, which was laced to the spar and then hoisted up on the outside of the shrouds, where it was crosslaced with heaving lines to prevent it flapping and destroying itself. When the doubled-canvas sail failed the second time, through blowing itself out, the remnants were brought down and another awning was put up similarly, but with the addition of a further gangway net, making four in all, and the noteworthy difference that the awning was not doubled. It thus gave a larger area but was not 'shaped' in any way. This (third) time, it lasted out and served its purpose throughout the remaining two-and-a-quarter days until the engine repairs were completed and the ship ready to move again.

One more jury rig was hoisted, between the foremast and the port samson post at No. 3 hatch. This awning, approximately 45-ft. x 15-ft., was first laced to its own ridge wire, one end of which was then hoisted up to the top of the samson post and shackled on to a wire strop which was made fast to the lug of No. 3 topping lift block. The forward end was hoisted by means of a tackle made fast to the port after-side of the foremast table, the hauling part of which was taken to No. 2 port winch. Its bottom corners were bowsed down by rope tackles. This awning was not doubled or backed in any way, but stood up well, and was a useful addition.

Improvised Sails

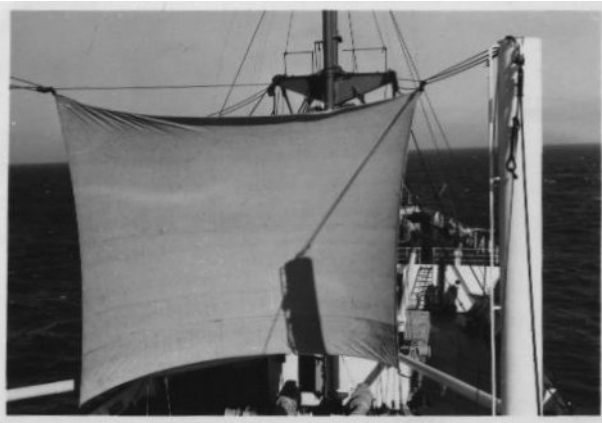
During the hold-up, the vessel drifted some 107 miles southwards off its course. Because of the destruction of No. 8 cylinder, damage to No. 7 unit and crankcase distortion, the engine had to be reduced from eight to six cylinders and revolutions from 105 to 50. It became evident the engine would have to be nursed in every way possible and, with the object of steadying the ship's movements and to take all practicable advantage of the favourable prevailing westerly winds, further sails were contrived.

No. 4 'tween deck, which had been discharged in New York, was fixed up as a sail loft and by utilizing three new hatch tarpaulins, two square sails and one staysail were made.

The square sails were each made of 36-ft. x 26-ft. tarpaulin, twice tabled by 4-in. and sewn down, with the addition of a 3-ft. x 3-ft. strengthening patch of repair canvas at each corner. A continuous boltrope was formed of 2³/₄-in. sisal, with a large cringle worked in at each corner. For downhauls, two small wooden blocks were attached to the 'head' of the sail, and rove off with point line.

The rigging for the first of these sails hoisted at No. 2 hatch, was as follows:-

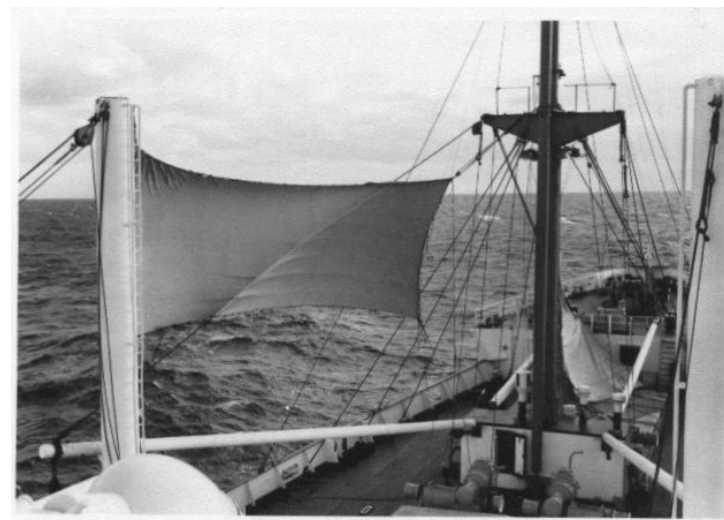
Two 3-in. wire snotters were made long enough to reach from the topping lift lugs on the after-side of No. 3 samson posts to the top of the posts. The ends of No. 2 port and starboard cargo runners were shackled into the free eye of the snotters, the bights being lead through snatch blocks both above (at the after-end of Foremast Table) and below, to provide a direct lead to the winch barrels.



The winches were walked back so that the two bights came down on No. 2 hatch and a 5-ton bow shackle was then placed over each runner to act as a 'traveller'. Two small wire strops formed the means of securing the cringles to the bow shackles. Two single blocks were used on either side of each shackle and rove off to form gun tackles (four in all) which acted as fore-and-aft braces for trimming the sail. The bottom cringles were fitted with small wire strops and luff tackles for sheets. A preventer rope was also attached to each corner and proved very handy when shifting the sheet tackles.

This sail could quite easily be trimmed by the deck watch to about six points either side of the fore-and-aft line and could be brought down and lashed within five minutes – this requiring only the fore-and-aft tackles to be cast off and the winches walked back.

The second square sail was prepared in the same manner as the first with the addition of a row of eyelets across the head of it, for owing to the absence of suitable samson posts a different rig had to be adopted. This sail was lashed to a 40-ft. spar formed of 10-ft. lengths of brine piping (no suitable spar being available) with supporting spans and hoisted up to the head of the heavy lift derrick, housed in its upright position on the fore-side of the after-mast house. The brine piping bent under the weight of the wind in the canvas and was a failure. The sail was then set up again by topping No. 5 derricks and hoisting it via the runners. This was more satisfactory except that as the wind shifted it was necessary to lower the canvas and adjust the derricks, rather a tricky manoeuvre at times with movement in the vessel, but one that was done repeatedly without mishap.



The last sail to be made was a staysail, which was hoisted on the foretopmast stay. This stood up to gale force winds, including squalls to force 9, and was of great help in steadying the vessel in the very rough quarterly seas then prevailing. When it had to be lowered for a minor repair, an attempt to rehoist it caused the topmast to whip so violently that the rehoisting had to be postponed until the wind eased off to force 6-7.

The M.V. Rakaia's average slip in ideal steaming weather and a fully-loaded condition is approximately 6 per cent. On the passage from New York to Liverpool she was in a half-loaded condition with a mean draft of 23-ft. 10-in., and a trim of 4-ft. 10-in. by the stern.

The area of canvas set when all three sails were in use was approximately 2,500 sq. ft., and the following table indicates in some measure their effect on the ship's progress in terms of a small and sometimes negative slip.

NOON TO NOON

State of Sea and Wind, Averaged for Twenty-Four Hours



The primary purpose, both of the jury rig and the temporary sails, was to steady the ship's movement, the jury to ease working conditions below for the engineers' difficult task, and the sails to ease strain on the weakened engine during the homeward run.

There seems no doubt that this purpose was achieved to a useful extent.

NOON TO NOON

State of Sea and Wind, Averaged for Twenty-Four Hours

Date Oct 1957	Course deg.	Wind Force	Sea	Swell	Revs.	Speed Knots	Slip per cent	Sails
16 th	070	NExN 3	Mod.	Mod. ENE	49.7	5.17	32.2	-
17 th	074	NExN 4	Mod.	Mod. NNE	48.5	5.50	25.8	-
18 th	074	ENE 6	Rough	Heavy ENE	45.0	3.50	48.15	-
19 th	074	S 3	Slight	Mod. SE	49.1	6.33	15.55	1500 hrs. No. 2 square sail hoisted.
20 th	058	SW 3	Slight	Low SSW	49.8	7.46	2.18	No. 2 square sail.
21 st	062	W 4	Slight/Mod.	Low WSW	49.5	8.0	- 5.62	1400 hrs. No. 5 square sail hoisted.
22 nd	065	SSW 4	Mod.	Mod/Low Wly	48.7	8.55	- 14.85	Nos. 2 and 5 square sails.
23 rd	068	NWxW 4/5	Mod.	Mod. SWly	49.2	6.83	9.39	Nos. 2 and 5 square sails.
24 th	070	NNW 3	Slight	Mod. Nly	49.8	7.75	- 1.68	Staysail hoisted 1400 hrs.
25 th	076	WNW 7	Rough	Heavy WNW	49.6	7.69	6.60	0300 hrs. Nos. 2 and 5 sails lowered.
26 th	079	NNW 5/6	Rough/Mod.	Heavy NWly	49.3	7.62	11.3	Staysail up. Staysail down 1200-1700 hrs.
27 th	078	WSW 5/6	Mod./Rough	Heavy SWly	50.0	7.83	- 2.17	All 3 sails up.
28 th	075	SW 6/7	Rough	Heavy WSW	49.2	7.45	1.13	All 3 sails up.
29 th	078	SWxW 8	Slight	Low SW	49.0	7.70	- 2.84	1000 hrs. All sails down and stowed.